DAC Express Release 3.5

(VT9801B)

DAC EXPRESS 3.5 HIGHLIGHTS

- **NEW** Support for EX1200, LXI Class A switch/measure and control
- **NEW** Generate alarms based on events
- **NEW** Send email notifications based on events
- **NEW** Combine multiple inputs as a calculated channel
- Display Wizard for fast test setups
- EX1629 48-channel high-performance remote strain measurement unit
- Combine multi-channel analog, digital, and counter measurements
- Low cost upgrade from earlier versions of DAC Express

VTI Instruments

Intuitive software saves you valuable time, VTI performance hardware gives you confidence in your measurements

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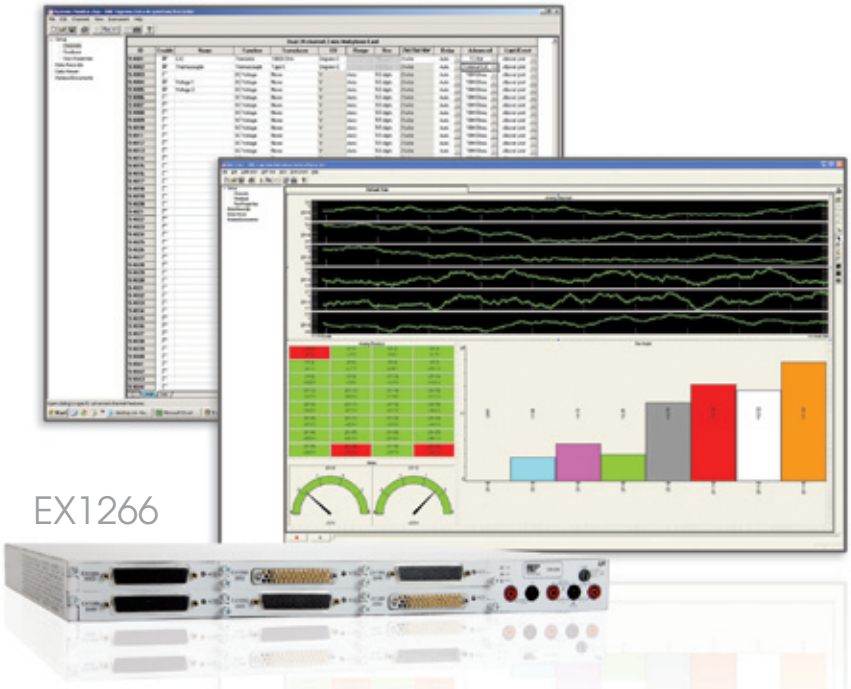


DAC Express systems are designed to solve your toughest problems in verifying designs of electro-mechanical products. Combined analog, digital, and counter measurement in a single system simplifies your test system development. If your measurements include noise, vibration, temperature, pressure, strain, voltage, digital states, rpm or other transducer-based parameters — and you're feeling the pressure of time — then a DAC Express system is the right solution for you.

Time Is Precious

When your new product introduction date is set in stone and you aren't finished testing, you can't afford to waste time with tedious programming tasks. DAC Express is fast to set up because it requires no programming. Connected hardware is auto-identified and ready for assignment to measurements.

Good Data The First Time

Performance validation testing of a new product requires a data acquisition system with answers you can trust. Non-repeatable results are not results at all. With features like superior self-calibration and certified accurate measurements, VTI measurement hardware provides all the measurement performance and reliability you need.

Combined Dynamic And Static Measurements

Combining high-speed measurements of noise or vibration signals and low-speed measurements of temperature, strain, and more, makes DAC Express the workhorse system of its class. High-speed sample rates can be set up to 196.6 kSa/sec/ch. Low-speed scanned sample rates can be set up to 1.25 kSa/sec/ch for 64 channels. In the standard configuration, all data goes to the host PC hard drive. For higher data transfer rates, the optional VTI data disk sends high and low-speed data streams to separate disks, ensuring continuous data rates of up to 9.25 MSa/sec for high-speed measurements and more than 400 kSa/sec for low-speed measurements.

Data Recorder Configuration

If your need is for noise and vibration measurements only, using microphones, accelerometers, or other voltage transducers, just connect your inputs to this system and go. Digital anti-alias filters on the high-speed channels can be set to Elliptical, Bessel for transient response testing, FIR for linear phase response, or off. (Note: FIR anti-alias filter is only available for the VT1432B/VT1435/VT1436 modules.) Data recording is real time with no gaps in data. Online displays include time records and single-block FFTs (may have data gaps due to lower priority than recording).

Data Logger Configuration

The simple name understates its power. Focusing on low-speed measurements such as temperature, strain, and more, the data-to-disk transfer rates of greater than 400 kSa/sec (for multiple modules) can be maintained while on-line monitoring displays show key values for the operator.

Multi-function Data Logger Configuration

Sometimes you need more than just analog data. If your job requires recording digital states, relay settings, shaft rpm, pulse train rates, or similar parameters in addition to analog signals, this system is the answer. You can easily configure a mix of channel types using DAC Express.

Structural Strain Measurements

Stress and fatigue testing of large structures has special requirements. VTI's solution provides structural test engineers with the performance needed for these large-scale tests. The Ethernet controlled 48-channel, high-performance remote strain gauge measurement unit offers built-in calibration and 24-bit resolution, providing very high data resolution and accuracy. Ethernet control allows for remote operation, which reduces cable lengths. The RJ-45 connector reduces transducer connector costs. Up to 500 channels of strain measurement are easily supported by DAC Express.

Precision Temperature Measurements

Today's leading suppliers of power generation and energy delivery products require cutting edge technology and superior performance to meet the world's most demanding energy requirements. Testing is a key aspect of gas and wind turbine manufacturing to ensure reliability and efficiency. R&D facilities depend on the superior measurement accuracy that is delivered by the EX1000A series to improve the efficiency of new designs. The intuitive DAC Express interface allows fast setup of over 450 measurement channels to facilitate test readiness. High accuracy measurements can be recorded at up to 1000 samples/sec/channel.

No Programming Required

The intuitive software user interface simplifies the time-consuming tasks of:

- Configuring hardware
- Conditioning transducers
- Setting measurement rates
- Developing display routines
- Creating data files
- Exporting data for analysis and report generation

It's all as simple as 1-2-3:

1. Setup
2. Record
3. View

Auto Instrument Discovery

If VTI data acquisition instruments are powered up and connected to your PC, DAC Express will automatically identify those resources for you. All installed signal conditioning is also identified so there is no question about which signals you can measure.

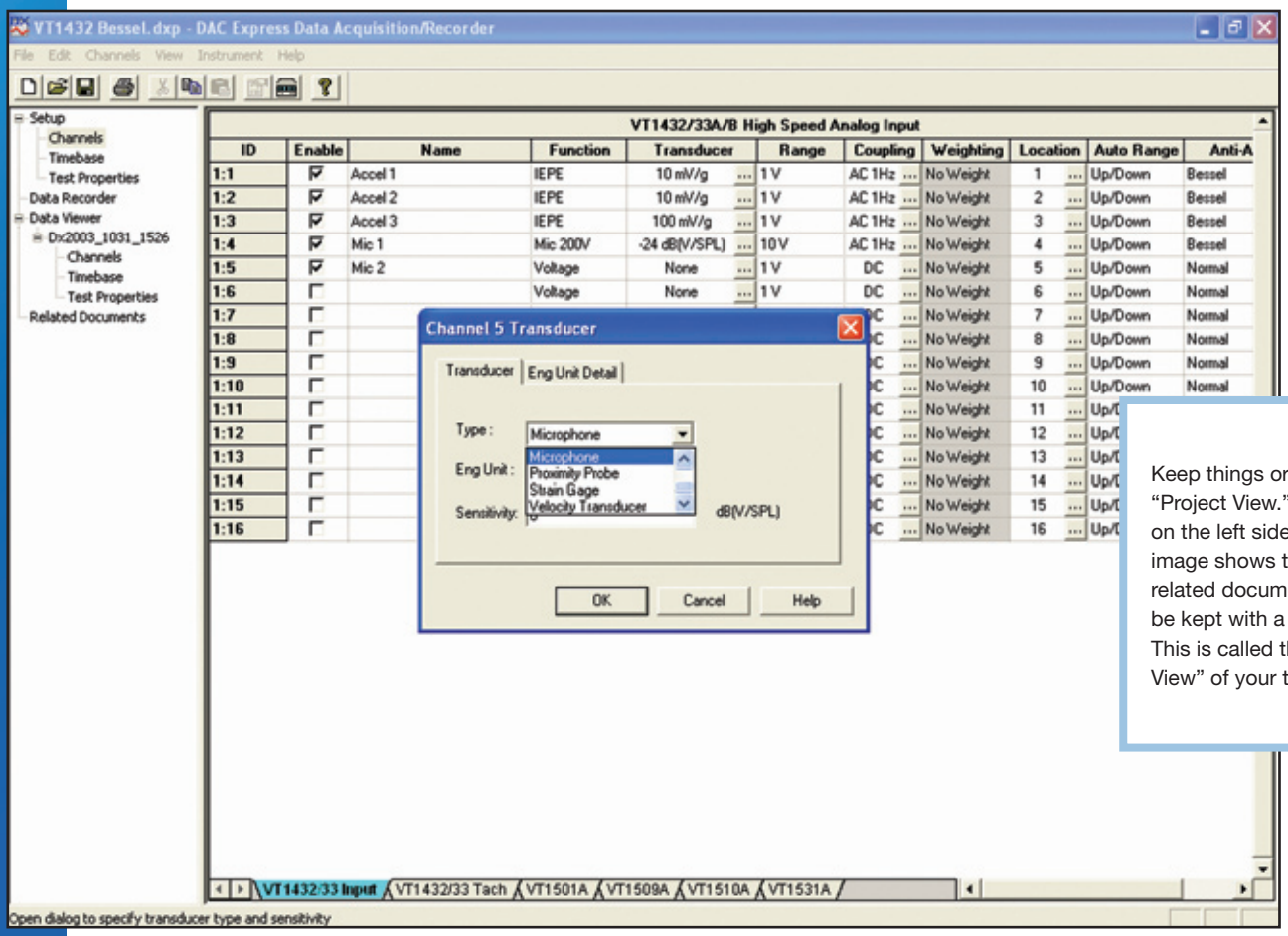
No Hardware Yet? No Problem!

Get a head start even before you have hardware. Use the DAC Express "simulate" mode to preconfigure instruments, then install the instruments when they're available.

Set Up Channels With Table/Menu Pull-Downs

Simply click on the tabs at the bottom of the screen to display the available measurement channels (shown below). This example screen shows three high-speed inputs connected to accelerometers and two connected to microphones.

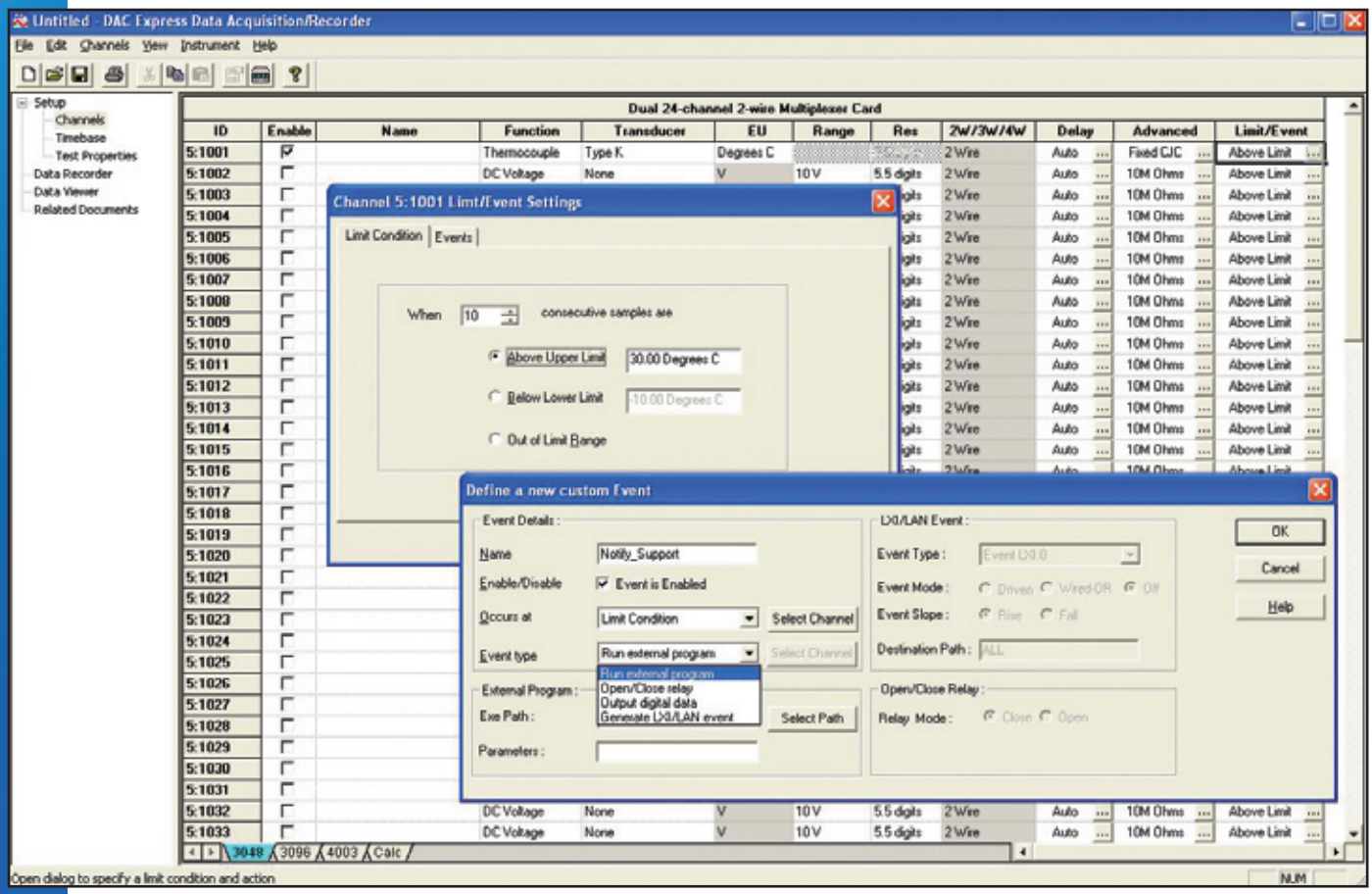
Select transducers from the pull-down menus shown in the highlighted window. The additional tabs allow you to select several types of signal conditioning for low-speed measurements such as temperature, voltage, resistance, or strain. For the few transducers not defined, you can easily convert the measured voltages to engineering units using a built-in mx+b linearization routine (provided in a separate setup window).


VT1432 Bessel.dxp - DAC Express Data Acquisition/Recorder
File Edit Channels View Instrument Help
Setup
Channels
Timebase
Test Properties
Data Recorder
Data Viewer
Dx2003_1031_1526
Channels
Timebase
Test Properties
Related Documents
VT1432/33A/B High Speed Analog Input
ID Enable Name Function Transducer Range Coupling Weighting Location Auto Range Anti-A
1:1 Accel 1 IEPE 10 mV/g 1 V AC 1Hz No Weight 1 Up/Down Bessel
1:2 Accel 2 IEPE 10 mV/g 1 V AC 1Hz No Weight 2 Up/Down Bessel
1:3 Accel 3 IEPE 100 mV/g 1 V AC 1Hz No Weight 3 Up/Down Bessel
1:4 Mic 1 Mic 200V -24 dB(V/SPL) 10 V AC 1Hz No Weight 4 Up/Down Bessel
1:5 Mic 2 Voltage None 1 V DC No Weight 5 Up/Down Normal
1:6 Voltage None 1 V DC No Weight 6 Up/Down Normal
1:7 No Weight 7 Up/Down Normal
1:8 No Weight 8 Up/Down Normal
1:9 No Weight 9 Up/Down Normal
1:10 No Weight 10 Up/Down Normal
1:11 No Weight 11
1:12 No Weight 12
1:13 No Weight 13
1:14 No Weight 14
1:15 No Weight 15
1:16 No Weight 16
Channel 5 Transducer
Transducer
Eng Unit Detail
Type :
Microphone
Eng Unit :
Microphone
Proximity Probe
Strain Gage
Velocity Transducer
Sensitivity:
dB(V/SPL)
OK
Cancel
Help
VT1432/33 Input
VT1432/33 Tach
VT1501A
VT1509A
VT1510A
VT1531A
Open dialog to specify transducer type and sensitivity

Keep things organized with "Project View." The tree view on the left side of the screen image shows the steps and related documents that can be kept with a specific test. This is called the "Project View" of your test.

Events

DAC Express 3.5 and the EX1200 series allow you to select from a flexible set of alarm conditions so you can be notified when critical test data exceeds its limits. If the data sample exceeds or falls below the level you specified, DAC Express signals an alarm event to occur. For example, you can trigger an alarm event when an input or combination of inputs exceeds specified temperature limits. Events can include the execution of a program, the transmission of an email, the opening or closing of a control relay, or the generation of a LAN/LXI event. For instance, you can generate an audible alarm signal or remove power due to high temperature levels under program control. Using the email alarm event, you can send warning messages to designated personnel worldwide if your test data goes beyond the limit you set.



Calibrated Strain Measurement

DAC Express makes large channel count strain measurements easy with the EX1629 Remote Strain Conditioning Unit.

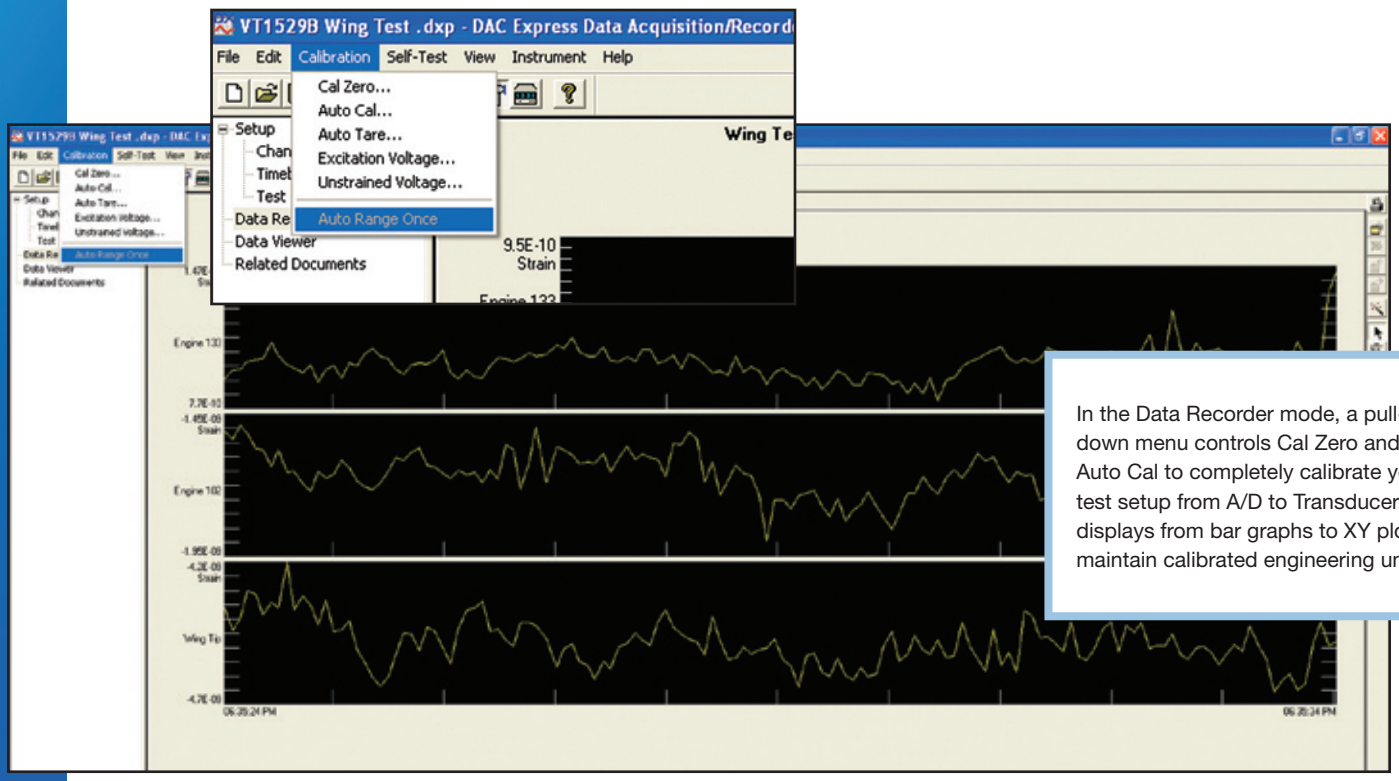
A pull-down menu controls Cal Zero, Auto Cal, Auto Tare, and Shunt Cal to completely calibrate your test setup from A/D to Transducer. Excitation and unstrained voltage per channel can be quickly measured before data collection and saved as part of the advanced channel settings for each project or data set.

Select Measurement Rates

Once you've created the channel connections, you set the sample rates in the timebase screen (not shown). The channel measurement rate for high-speed digitizer channels can be set independently from that of the scanning A/D channels. You can also set the length of the test and the triggering conditions before starting the test.

Just Press "Record"

It's as simple as that. Measurements will start and stop based on the criteria specified in the timebase setup. But, there's more to good data acquisition than recording. DAC Express supports many powerful data monitoring, display and export features.



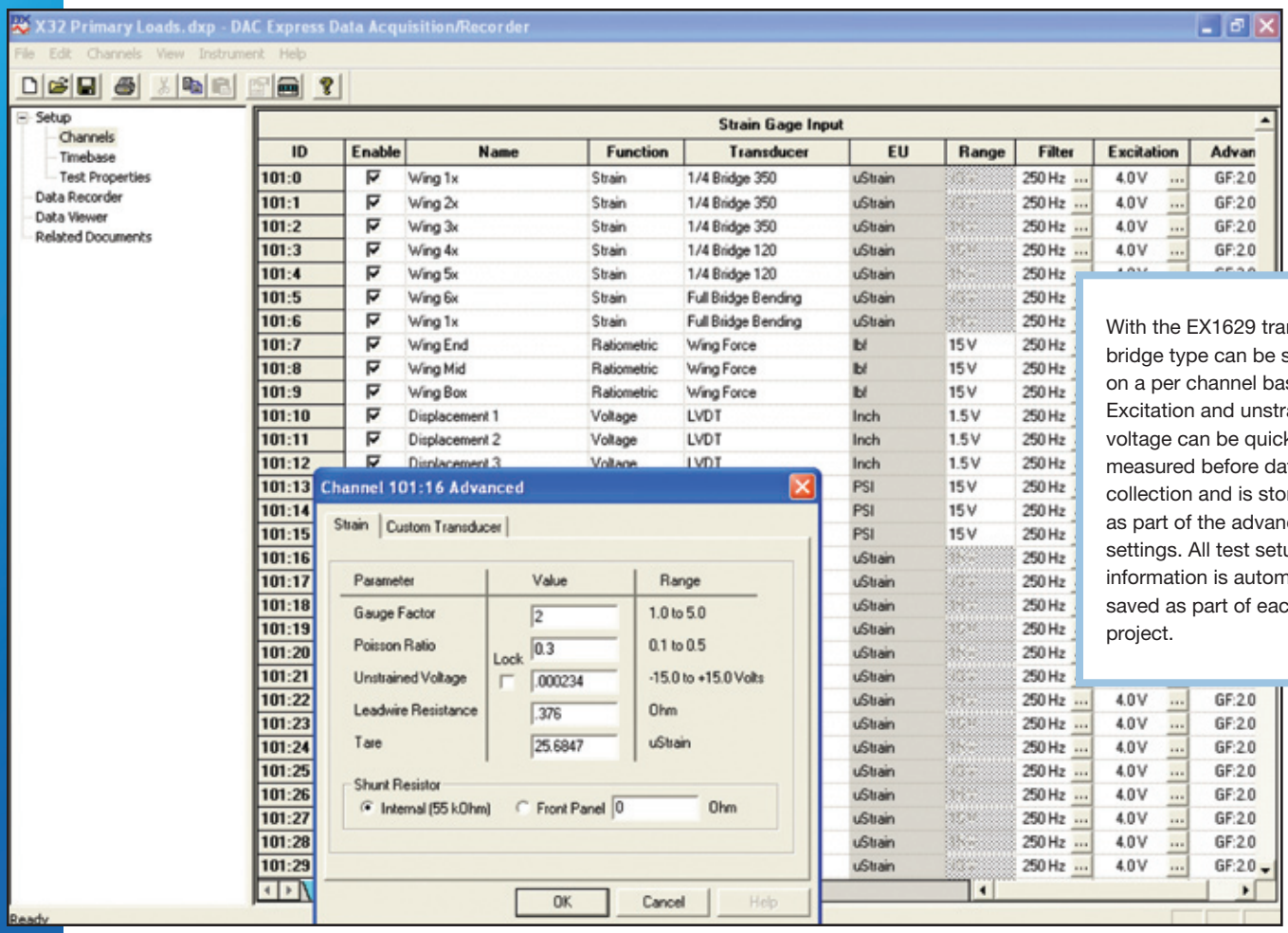
In the Data Recorder mode, a pull-down menu controls Cal Zero and Auto Cal to completely calibrate your test setup from A/D to Transducer. All displays from bar graphs to XY plots maintain calibrated engineering units.

Monitor Key Channels With Online Displays

Even with computer-based instrumentation, there's still a feeling of confidence when you can observe the key data values and trends during the test. Multiple displays can be created on additional tabs so you can group displays in order of importance.

All the basic types are available:

- Numeric readouts
- Meters
- Bar graphs
- Strip charts
- Linear frequency spectrums
- Digital strip chart
- XY plot


X32 Primary Loads.dxp - DAC Express Data Acquisition/Recorder
File Edit Channels View Instrument Help
Setup
Channels
Timebase
Test Properties
Data Recorder
Data Viewer
Related Documents
Strain Gage Input
ID Enable Name Function Transducer EU Range Filter Excitation Advan
101:0 Wing 1x Strain 1/4 Bridge 350 uStrain 250 Hz 4.0V GF:2.0
101:1 Wing 2x Strain 1/4 Bridge 350 uStrain 250 Hz 4.0V GF:2.0
101:2 Wing 3x Strain 1/4 Bridge 350 uStrain 250 Hz 4.0V GF:2.0
101:3 Wing 4x Strain 1/4 Bridge 120 uStrain 250 Hz 4.0V GF:2.0
101:4 Wing 5x Strain 1/4 Bridge 120 uStrain 250 Hz
101:5 Wing 6x Strain Full Bridge Bending uStrain 250 Hz
101:6 Wing 1x Strain Full Bridge Bending uStrain 250 Hz
101:7 Wing End Ratiometric Wing Force lbf 15 V 250 Hz
101:8 Wing Mid Ratiometric Wing Force lbf 15 V 250 Hz
101:9 Wing Box Ratiometric Wing Force lbf 15 V 250 Hz
101:10 Displacement 1 Voltage LVDT Inch 1.5 V 250 Hz
101:11 Displacement 2 Voltage LVDT Inch 1.5 V 250 Hz
101:12 Displacement 3 Voltage LVDT Inch 1.5 V 250 Hz
101:13 PSI 15 V 250 Hz
101:14 PSI 15 V 250 Hz
101:15 PSI 15 V 250 Hz
101:16 uStrain 250 Hz
101:17 uStrain 250 Hz
101:18 uStrain 250 Hz
101:19 uStrain 250 Hz
101:20 uStrain 250 Hz
101:21 uStrain 250 Hz
101:22 uStrain 250 Hz 4.0V GF:2.0
101:23 uStrain 250 Hz 4.0V GF:2.0
101:24 uStrain 250 Hz 4.0V GF:2.0
101:25 uStrain 250 Hz 4.0V GF:2.0
101:26 uStrain 250 Hz 4.0V GF:2.0
101:27 uStrain 250 Hz 4.0V GF:2.0
101:28 uStrain 250 Hz 4.0V GF:2.0
101:29 uStrain 250 Hz 4.0V GF:2.0
Channel 101:16 Advanced
Strain
Custom Transducer
Parameter
Value
Range
Gauge Factor
2
1.0 to 5.0
Poisson Ratio
Lock
0.3
0.1 to 0.5
Unstrained Voltage
.000234
-15.0 to +15.0 Volts
Leadwire Resistance
.376
Ohm
Tare
25.6847
uStrain
Shunt Resistor
Internal (55 kOhm)
Front Panel
0
Ohm
OK
Cancel
Help
Ready

With the EX1629 transducer, bridge type can be set on a per channel basis. Excitation and unstrained voltage can be quickly measured before data collection and is stored as part of the advanced settings. All test setup information is automatically saved as part of each project.

DAC Express allows you to choose the display type that best fits your needs — whether you want current values, short-term variations, or trend lines. As soon as you assign a channel to a display, it begins to show current measured values. It's easy to check channel connections and calibrations visually without having to store data and sift through it later.

Customize The Display In Minutes

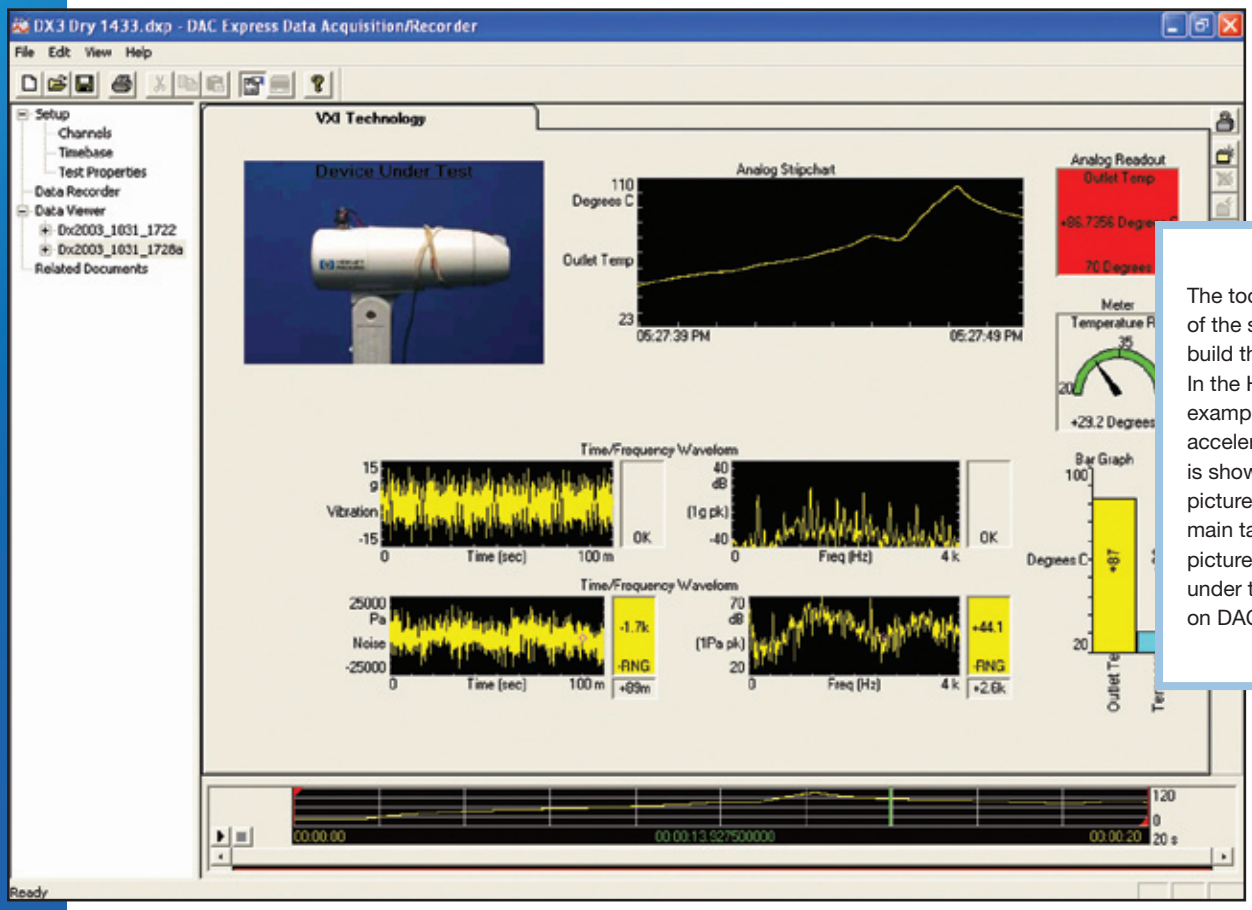
The display toolbar shows all the available display types. Just click, drag, and size the displays to meet your needs. Next, select the channel connection, data names, font type and size, and even display color based on value limits. Background graphics can be added to displays for custom views.

There's no need to recreate the displays or keep track of where you saved them when you want to re-run the same test later. They are part of the "Project View" of your test and are always readily available.

Easily View Multiple Display Types

In the hair dryer test example shown below, high-speed vibration and noise data is collected and monitored as time records and frequency spectrums. The strip chart simultaneously displays temperature. Temperature is also displayed in the numeric readout with an alarm set to 70 degrees C. Plus or minus alarms are available on meter and bar graph displays as well. Color change and text messages make alarm conditions instantly visible in record and view modes.

Channel to channel comparisons, such as temperature profiles, are easily made using the bar graph displays. The strip chart display is used to show the change in temperature as the hair dryer is run through its speed and heat settings.



The toolbar on the right of the screen is used to build the online display. In the Hair Dryer test example shown here, the accelerometer placement is shown in the jpeg picture placed on the main tab. Any number of pictures of your device under test can be placed on DAC Express displays.

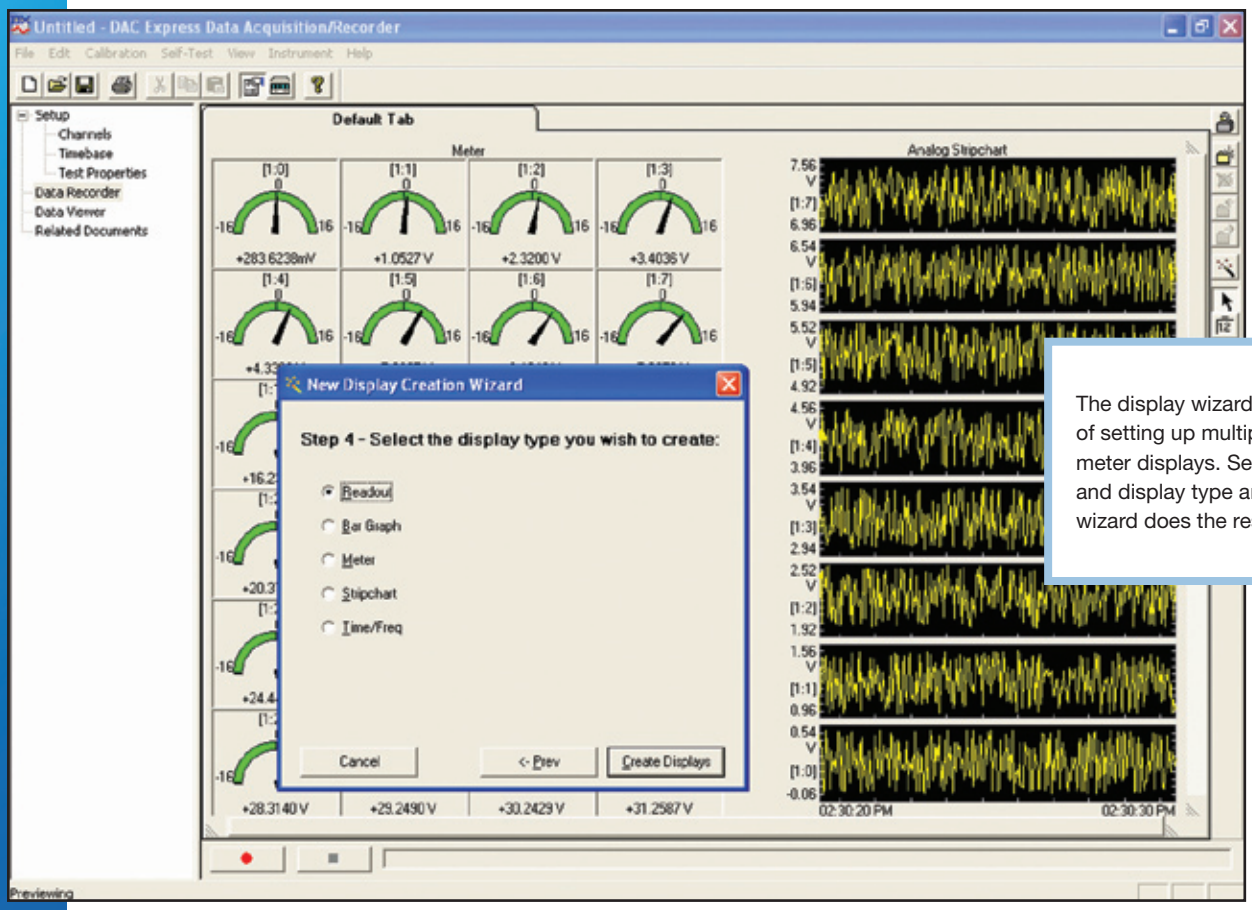
You Have The Data – Now What?

Collecting data is sometimes the easiest part. While sifting through the recorded data to identify significant events can be an overwhelming task at best. DAC Express simplifies this task for you with powerful data viewing, replay and export capabilities.

Data Viewer Is The Window Into Your Data

DAC Express provides two easy ways to look at your data. The first option is to play back the data through the same monitoring displays used during recording. The second option is to use the browser to manually scroll through the data. When you press the play button, the green marker on the scrollbar display at the bottom of the data viewer screen shows the approximate file location of the displayed data.

Saved data can be replayed through the same displays as many times as needed. New displays can be added to this tab, or created on new tabs, and saved for future use.



The display wizard makes fast work of setting up multiple graphs and meter displays. Select your channels and display type and the display wizard does the rest.

See All The Data On A Channel

The data browser allows you select a specific channel for closer review. Simply right-click on the scrollbar display, select the desired channel, and the entire data stream collected for that channel will be displayed in the browser. Then, move the green cursor marker with the mouse to select a point of interest. The numeric readout below the cursor displays a single value and time at that point in the data file.

Export Key Data

DAC Express exports data in all common formats – including comma separated value (CSV), tab delimited (TXT), and system data file (SDF) – for use in your favorite analysis tools such as Microsoft® Excel or MATLAB® from The MathWorks.

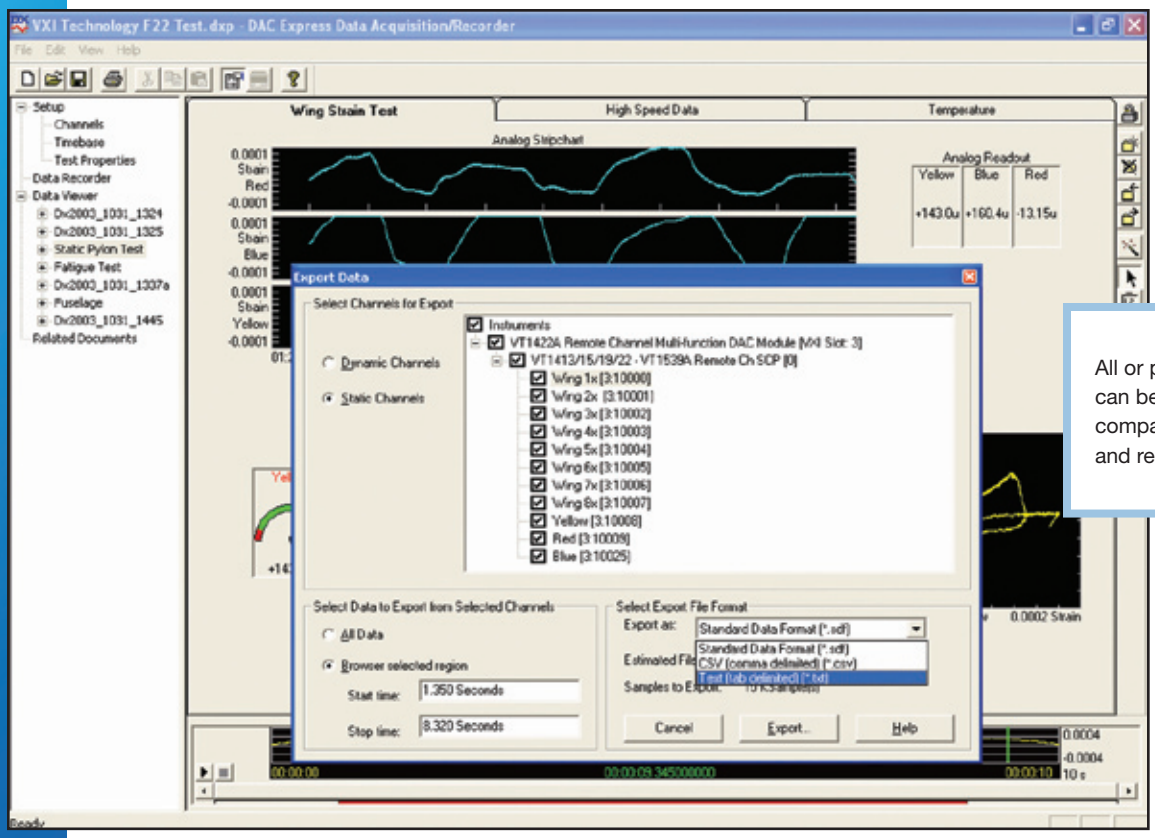
You can export all data or selected data using the red markers on the scrollbar. All exported data files include header information such as the test file name, data, and channel number making it easy to identify your data.

Keep Track Of Related Documents

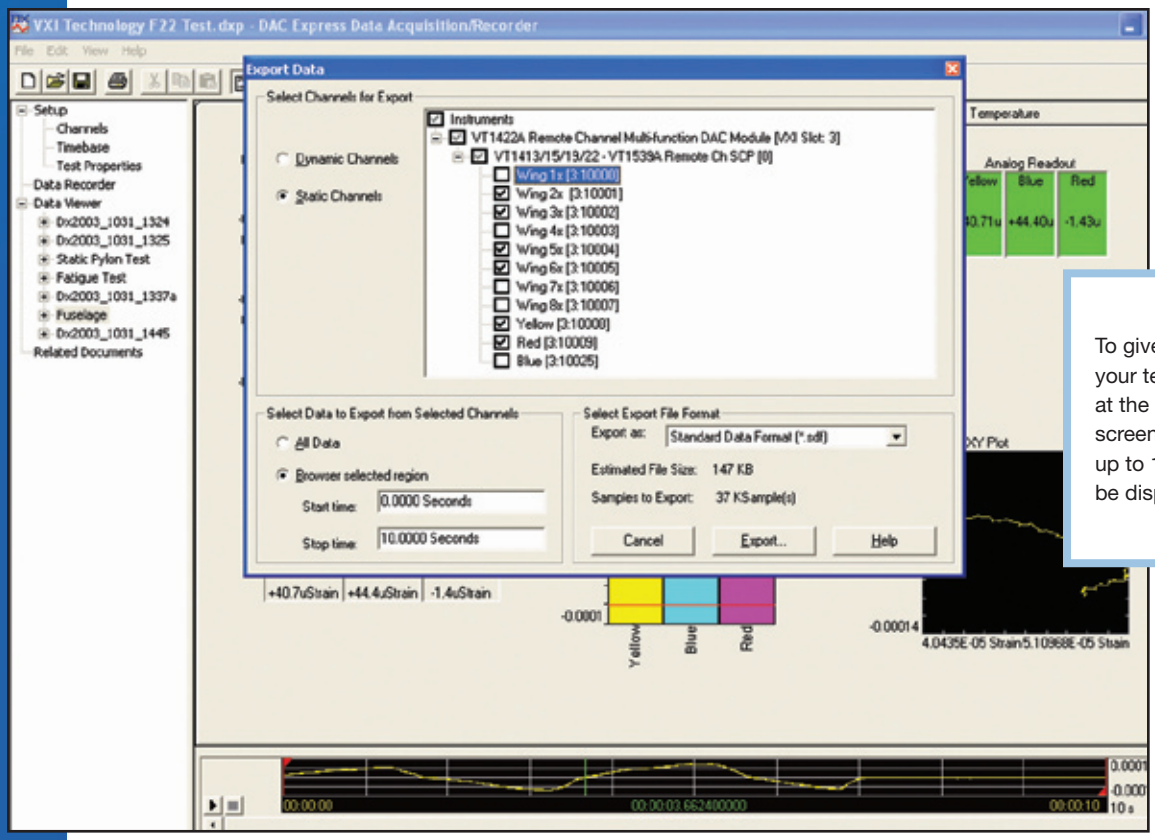
It's easy to keep track of templates for analysis or report generation by adding them to the Related Documents folder. No more searching your disk for the right file. It's all part of the DAC Express Project View for your data recording needs.

Ordering Information

VT9801B	DAC Express Data Acquisition/Recorder Software
VT9801U	Upgrade DAC Express Data Acquisition/Recorder Software Please send old password with PO to receive upgrade price



All or part of the recorded data can be quickly exported in formats compatible with popular analysis and reporting software.



To give you a complete overview of your test, the data browser trace at the bottom of the data viewer screen compresses the data view up to 1000 times. Any channel can be displayed in the data browser.

DAC Express Release 3.5

Specifications Summary

Minimum System Requirements

Windows 2000, XP or Vista
1.4 GHz processor or faster
256 MB RAM or more
500 MB available space on hard drive for program code plus space for data storage
CD/DVD drive for installation
10/100-T Ethernet
17 inch, 1024x768 resolution display monitor

Data Storage Requirements

VT143xB	2 bytes +32 bytes/blocksize selected) per sample plus fixed overhead of 100 kBytes per recording
VT1413C, VT1415A, VT1419A, VT1422A, EX10xxA, EX1629, EX1262, EX1266, EX1268	4 bytes per sample plus fixed overhead of (430 bytes times the number of enabled channels) per recording

Maximum Data File Size

VT143xB	2 G blocks/channel
VT1413C, VT1415A, VT1419A and VT1422A, EX10xxA, EX1629, EX1262, EX1266, EX1268	2 Gscans/channel

Max Scan Rate

VT1413C	1.25K scans/sec for 64 ch to 10K scans/sec for 3 channel
VT1419A, VT1415A	700 scans/sec for 64 ch to 5K scans/sec for 5ch
VT1422A, VT1529B	500 scans/sec for 64 ch to 2000 scans/sec for 1 channel
EX10xxA	1000scans/sec per channel
EX1629	25Ksamples/sec per channel (16 channels) 10Ksamples/sec per channel (48 channels)
EX1262, EX1266, EX1268	500 scans/sec

Supported VXI Interfaces

Ethernet/LXI (10/100/1000-T)	EX2500A
Firewire	E8491B
USB	NI VXI-USB
MXI-2	NI MXI-2

Precision Thermocouple/Voltage Measurements, LXI (EX1000A, EX1016A, EX1032A, EX1048A)

48 channels per 1U box
Thermocouple, +/-10 V
One muxed A/D with integrated signal conditioning

Precision Strain/Voltage Measurements, LXI (EX1629)

48 channels per 2U box
Strain, +/-15 V
One A/D per channel with integrated signal conditioning

Modular, High-Density Switch/Measure and Control, LXI (EX1262, EX1266, EX1268)

Up to 576 channels per 1U box
Thermocouple, RTD, Thermistor, +/- 300 V, frequency, period, current, resistance, signal switching, digital and analog I/O
Integrated 6.5 digit DMM
Virtual/calculated channels
Built-in functions: min/max, avg, sin, cos, tan, log, exp, sqrt, abs

Noise/Vibration measurements, VXI (VT1432B, VT1433B, VT1435, VT1436)

Up to 16 channels per slot, supports maximum sampling rate for each device
One A/D per channel (with anti-aliasing filters)

Modular Data Acquisition, VXI (VT1413C, VT1419A, VT1415A, VT1422A)

Up to 64 channels per slot available
One muxed A/D per 64 channels (filtering provided on SCPs)
Thermocouple, RTD, thermistor, strain, output, current, digital (isolated/non-isolated), counter